# DEVELOPMENT OF A NON-FORMAL EDUCATION PROFRAM BASED ON PROBLEM-BASED LEARNING AND SELF-DIRECTED LEARNING TO DEVELOP PERSONAL MASTERY COMPETENCY FOR HEAD NURSES

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**Abstract:** The paper dealt with the design of a non-formal education program for developing head nurses' personal mastery based on problem-based learning (PBL) and self-directed learning (SDL),with the following purposes: (i) to study the problems and learning needs in nursing management in order to develop personal mastery of the head nurses, (ii) to develop a non-formal education program based on PBL and SDL, (iii) to study the effects of the non-formal education program on the personal mastery of the head nurses, and (iv) to analyze the relevant factors of the program. The program in divided into four phases: (1) learning need assessment; in which the studies of 345 head nurses of the public hospitals were employed to assess learning needs in nursing management, (2) program development; in which development of a non-formal education program based on need assessment was conducted, (3) program implementation; in which the developed program was applied to 31 head nurses, compare with the control group of 31 head nurses using classroom lecture, and (4) factor analysis; in which data were analyzed to obtain relevant factors and suggestions.

The research results could be summarized as follows: The head nurses' problems were identified as nursing management; planning, organizing, staffing, directing, and controlling. The program, developed on the bases of the foregoing problems, was found statistically at 95% confidence level to improve the head nurses' competency in the personal mastery, consisting of knowledge, attitude, and problem-solving skills in nursing management and self-directed learning competency. The success of the developed program depended on participation of the learners, relationship between the facilitators and learners, instructor's experiences, instruction contents and learning activities, availability of learning resources, and peace full environment.

## Introduction

The world health-care systems, including that of Thailand, are confronted with the problems posed by laws and legislation, complaints from patients, maintaining excellence in know-how and services, development of work force, and creating a friendly work environment.

Nursing organizations need competent leaders, including the head nurses who are able to continuously analyze and evaluate the long-term and short-term situations within and without the organizations sensitive to the situation changes, to create consensus among the personnel, to manage their personnel successfully in order to meet the problems and challenges faced by any health-care systems and health-care institutions (Orapan Tosingh and Doungkamol Watradul 2008).

In an attempt to serve some of the basic requirements in problem solving and a constant search of personal mastery by the leaders, especially the head nurses, an institutional non-formal education program based on Boyle (1981) was proposed. In this program, Boyle dealt with the problem analysis, planning, instructions and evaluation on the part of instructions, Boyle did not specify any specific learning methods. In this research, the PBL and SDL methods were applied to the instruction part.

## Objective of research

(1) To study the problems and learning needs in nursing management in order to develop personal mastery of the head nurses.

(2) To develop a non-formal education program based on problem-based learning (PBL) and self-directed learning (SDL) to develop personal mastery competency for head nurses.

(3) To study the effects of the non-formal education program based on problem-based learning (PBL) and self-directed learning (SDL) on the personal mastery of the head nurses.

(4) To analyze the relevant factors and condition of using the non-formal education program based on problem-based learning (PBL) and self-directed learning (SDL) to develop personal mastery competency for head nurses.

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**Literature review**

1. Non-formal education program; concept and principles
    2. Problem-based learning; concept, principles and processes
    3. Self-directed learning; concept, principles and processes
    4. Personal mastery competency; concept and principles
        5. Role and responsibility of head nurses
        6. Problems in nursing management
        7. Relevant researches

**The conceptual Framework**

According to study and research review related to non-formal education program, problem-based learning, self-directed learning, and researcher synthesize the conceptual framework for research as follows: (see Figure 1 in last page)

**Research methodology**

This is the Research and Development design, the researcher arranged this research into four phases:1) learning need assessment 2) developing the non-formal education program based on problem-based learning (PBL) and self-directed learning (SDL) 3) Implementing the non-formal education program based on problem-based learning (PBL) and self-directed learning (SDL) 4) Analyzing the relevant factors and conditions of implementing the non-formal education program based on problem-based learning (PBL) and self-directed learning. The research was carried out in the following order:

Phase 1 A Study of the problems and learning needs of head nurses in order to develop their personal masteryIn the study, the population were 2,495 head nurses working in 500-bed hospitals, and the sample size was determined in accordance with Taro Yamane (1973, cited by Wannee Gamket, 2008) at 0.05 error and 95% confidence level, resulting in a sample size of 345 head nurses. Then, after multi-stage stratified random sampling, samples were obtained from 16 hospitals, the data from which the studies of nursing management problems, contents, competence required from the developed program, and learning activities in order to improve the head nurses' personal mastery were carefully studied.

Phase 2 Development of a Program, Based on Problem-Based Learning and Self-Directed Learning, for Non-Formal Education for Head Nurses' Personal Mastery According to the usefully of learning need data from phase 1, the researcher analyzed the concept of the non-formal education, problem based-learning, Self-directed learning for creating the program that was based on one to three steps of Boyle's program development process as follow:

Step 1. Defining learning groups from head nurses and deputy head nurses who would be ready for promotion to the head-nurse positions and supported by their superiors to participate in the developed non-formal education program.

Step 2. Specifying the program contents in the areas of planning, organizing, personnel management (staffing), directing and controlling

Step 3. Learning plan

Program development based on problem-based learning and self-directed learning consists of 6 steps; (i) Problem analysis and hypothesis generation. (ii) Identification of learning issues and information resources, and design of learning plans. (iii) Information gathering and self-directed learning. (iv) Discussion of the acquired knowledge and critical debate. (v) Practical application of the resulting knowledge. (vi) Reflection on the contents and process, and evaluation of the learning outcome.

2.1 A non-formal education program to improve the head nurses' personal mastery was developed on the basis of the study results from phase 1. The program was composed of objective, learners' grouping, and group of facilitators, contents, learning activities, learning resources and learning material, environment, and evaluation.

2.2 The developed program passed the review by 5 experts in the areas of non-formal education and nursing education with consistency index (IOC) of 0.8-1.0.

2.3 Data collection tools were developed which were composed of:

- A multiple-choice questionnaire of the knowledge in nursing management problem solving;
- A rating scale on the attitude on nursing management problem solving;
- A rating scale on the measurement of skills in nursing management problem solving; and
- A rating scale on the measurement of competence of self-directed learning, based on Guglielmino (2008)

2.4 The data collection tools in 2.3 were checked by 12 experts to obtain the a consistency index (IOC).Then, they were applied to 30 head nurses whose properties were similar to those of the samples for reliabilities' checking and the results were as follows: 0.8 for the test form, 0.92 for both attitude and skills, and 0.96 for self-directed learning form.

Phase 3 Implementing the non-formal education program based on problem-based learning (PBL) and self-directed learning (SDL) for testing the non-formal education program. The nature of the proposed research was quasi experimental. The samples underwent a pre-test to statistically divide

them into two groups, i.e. the experimental group and the control group. On the basis of the 4 aspects, i.e. knowledge, attitude, skills, and self-directed learning, both groups underwent firstly a pre-test and secondly a post-test; and their average scores did not differ significantly at the level of 0.05.

The purpose of the pre-test was to ensure that the selected quasi-experimental research nature was valid; whereas that of the post-test was to obtain the data needed in the evaluation of the proposed non-formal education program.

These techniques were applied to 62 head nurses at the Bhumiphol Hospital. Then, the samples were divided into 2 groups of 31 each, i.e. one experimental group and one control group. A pre-test on the basis of on the knowledge, attitude, problem-solving skills, and self-directed learning competence was applied to the two groups; and statistically the scores did not differ significantly at the level of 0.05.

After the pre-test, the following experiments were carried out. An experiment, in accordance with the developed program, was conducted on the experimental group for 10 days from July 11-25, 2504; whereas another experiment, using the lecture-based learning, was performed on the control group for 5 days on July 11, 14, 20, 21 and 25, 2554, using the same instructors on the same dates, and the same durations.

Step 5 Evaluation the program: the program evaluation was divided into 3 phase;

1. Pre-experimental phase: Both experimental and control groups were assessed by using personal mastery evaluation form (knowledge, attitude, skill in nursing management problem, self-directed learning evaluation) and collected for the baseline data.
2. Post-experimental phase: Both experimental and control groups were assessed by using personal mastery evaluation form (knowledge, attitude, skill in nursing management, self-directed learning evaluation) and the collected data were compared to the baseline data by using the difference statistical t-test analyzed.
3. Assessing competency and knowledge transferring: After 1 month experiment. The experimental group and supervisor were in-depth interviewed by the researcher for confirming competency and knowledge transfer in workplace.

Phase 4 Analysis of the Problems, Obstacles and the Remedies After applying the developed non-formal educational program for some length of time, interviews with a group of the instructors and the past trainees were conducted to identify the related problems and obstacles, and also any possible remedies.

## Results

### Data Input
The number of the head nurses was 345, all female, 41-50 years of age (56.5%), working in the medicine division (22.6%), 20-30 years of work experience (70.1%), in-position experience of 1-10 years (65.5%), with bachelor degrees (66.4%), and with past training experience in nursing management (80.3%) with the training duration of 2-5 days (45.9%).

Their needed knowledge was found to be in the following 5 aspects, i.e. planning related to strategic developments; organizing related to the nursing assignment; personnel management in staffing and scheduling; directing in the area of development of communications and leadership skills; and controlling in nursing quality control.

With reference to learning participation, the majority of the head nurses (93.6%) were interested in the training program in order that their updated and enhanced knowledge would be, to some extent, beneficial to their work (25.6%). Some (29.6%) was with a view that the most appropriate training duration was 10 days; some (50.1%) considered that the most suitable period of time for training was from May to August; and some (41.14%) suggested that, for their benefits from using the acquired knowledge for the development and operation planning for the next fiscal year, they would like to attend a training program in a workshop form (48.6%).

### Process
The process employed was the developed non-formal education program for developing head nurses' personal mastery, based on problem-based learning and self-directed learning.

### Result Output
The developed non-formal education program was applied to the 62 head nurses at Bhumiphol Adulyadej Hospital, a 750-bed hospital. It could be seen from Figure 1 that the system under consideration was composed of an input, a process and an output. The test results indicated the following:

1. Before and after the training, the experimental group's average scores, based on the knowledge, attitude, problem-solving skills in nursing management, and competence in self-directed learning, significantly differed at the level of 0.05, noting that the post-training average score was higher than the pre-training one.

2. Before and after the training, the control group's average scores, based on the knowledge, attitude in nursing management, significantly differed at the level of 0.05, with the post-training average score higher than the pre-training one.

3. Before and after the training, the control group's average scores, based on the problem-solving skills in nursing management and competence in self-directed learning, did not significantly differ at the level of 0.05.

4. Comparing on the basis of the knowledge, attitude, problem-solving skills in nursing management, and competence in self- directed learning, the experimental group's score with that of the control group, the difference was statistically significant at the level of 0.05; and it should however be noted that, in all respects, the average score of the former was higher than that of the latter.

5. The results of an interview with the trainees (head nurses) and their superiors revealed the following. Trainees' positive changes occurred as a result of the developed personal mastery in the areas of (i) knowledge and management competence; (ii) attitude in which positive thinking, esteem of oneself and others, and more work incentive and confidence were developed; (iii) constructive problem solving; and (iv) self-directed learning readiness, learning interest and a constant search for knowledge. As for the superiors' point of view, the trainees improved in all respects, including mental stability, and a strong determination to develop their competence and their organization.

6. Analysis of the Problems, Obstacles and the Remedies: The success of the developed program rested upon the following factors. (i) Learners - participation and experience exchanges among the learners could promote an efficient learning atmosphere; (ii) Group facilitator – their good relationship with the learners and their positive thinking could be a good incentive for learning; (iii) Learning activities – six learning steps and activities to adjust low-frequency brain waves could result in relaxation, fixed mind, more active participation and an incentive for a good learning atmosphere; (iv) Source of knowledge and media – problem-based learning modules and scenarios corresponding to learners' problems, experienced instructors, books, up-to-date documents and internet services; and (v) Environment – training rooms' atmosphere should be peaceful, private and relaxing.

**Conclusion and Discussion**

It is the first time in Thailand that a program based on problem-based learning and self-directed learning was successfully applied to nursing management personal especially head nurses, in order to improve competence of the management and operational personnel in problem solving, management, life-long learning, positive thinking, self-esteem and a good relationship among the personnel .In general, although a problem-based program consumes too some extent more time and resources, it is more effective than a lecture-based program. In additional, problem-based learning program also supports principles of adult learning and promotes independent, self-directed inquiry skills that foster problem-solving competence. Therefore, the staff educator should use problem-based learning as an effective tool for training in the staff development activities.

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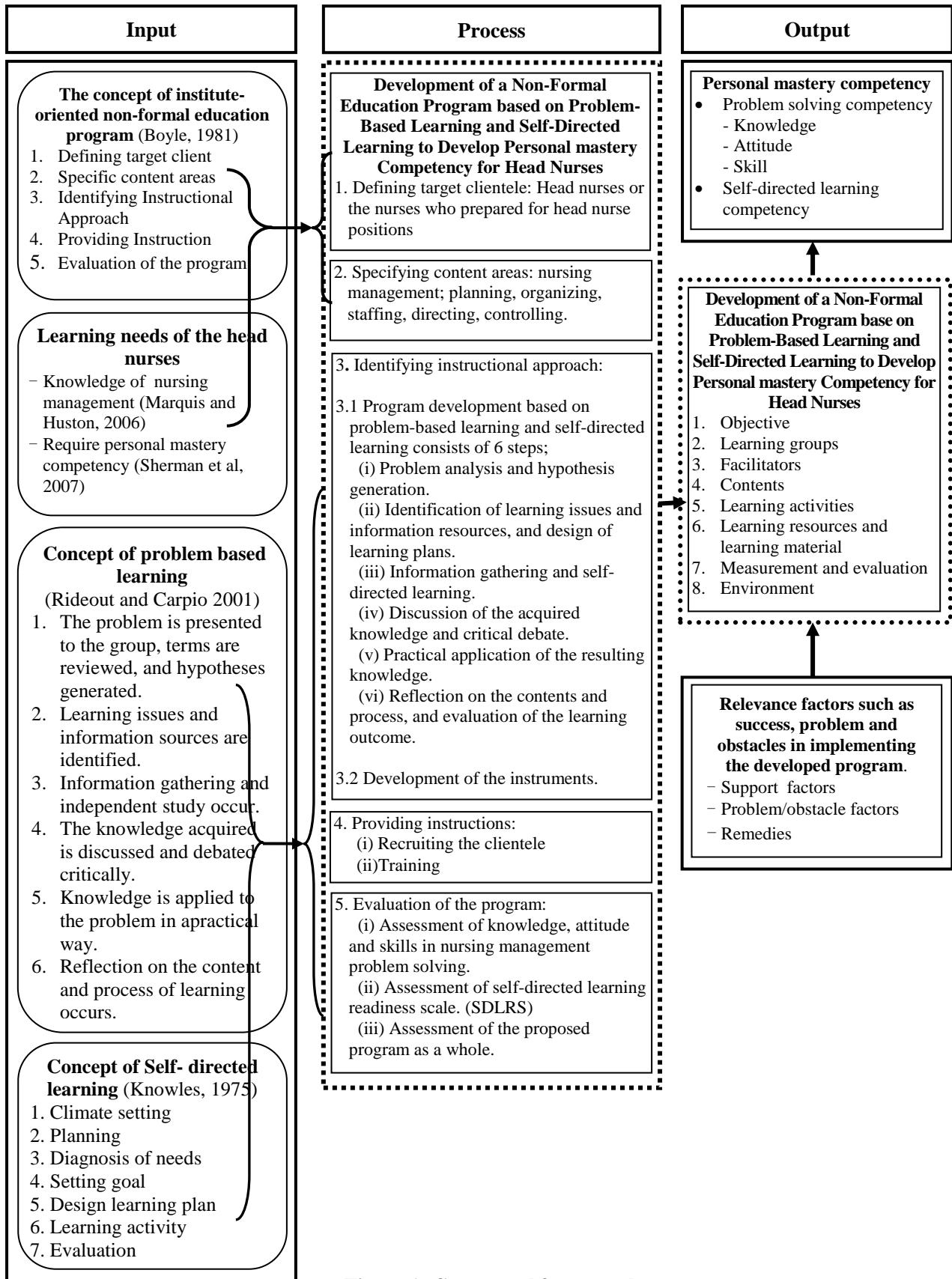Wannee Gamket. (2008). *Research Methodology in Behavioral Sciences.* Bangkok: Chulalongkorn University.

| **Input** | **Process** | **Output** |
|---|---|---|

**The concept of institute-oriented non-formal education program** (Boyle, 1981)
1. Defining target client
2. Specific content areas
3. Identifying Instructional Approach
4. Providing Instruction
5. Evaluation of the program

**Learning needs of the head nurses**
− Knowledge of nursing management (Marquis and Huston, 2006)
− Require personal mastery competency (Sherman et al, 2007)

**Concept of problem based learning**
(Rideout and Carpio 2001)
1. The problem is presented to the group, terms are reviewed, and hypotheses generated.
2. Learning issues and information sources are identified.
3. Information gathering and independent study occur.
4. The knowledge acquired is discussed and debated critically.
5. Knowledge is applied to the problem in apractical way.
6. Reflection on the content and process of learning occurs.

**Concept of Self- directed learning** (Knowles, 1975)
1. Climate setting
2. Planning
3. Diagnosis of needs
4. Setting goal
5. Design learning plan
6. Learning activity
7. Evaluation

**Development of a Non-Formal Education Program based on Problem-Based Learning and Self-Directed Learning to Develop Personal mastery Competency for Head Nurses**
1. Defining target clientele: Head nurses or the nurses who prepared for head nurse positions

2. Specifying content areas: nursing management; planning, organizing, staffing, directing, controlling.

3. Identifying instructional approach:

3.1 Program development based on problem-based learning and self-directed learning consists of 6 steps;
  (i) Problem analysis and hypothesis generation.
  (ii) Identification of learning issues and information resources, and design of learning plans.
  (iii) Information gathering and self-directed learning.
  (iv) Discussion of the acquired knowledge and critical debate.
  (v) Practical application of the resulting knowledge.
  (vi) Reflection on the contents and process, and evaluation of the learning outcome.

3.2 Development of the instruments.

4. Providing instructions:
  (i) Recruiting the clientele
  (ii)Training

5. Evaluation of the program:
  (i) Assessment of knowledge, attitude and skills in nursing management problem solving.
  (ii) Assessment of self-directed learning readiness scale. (SDLRS)
  (iii) Assessment of the proposed program as a whole.

**Personal mastery competency**
• Problem solving competency
  - Knowledge
  - Attitude
  - Skill
• Self-directed learning competency

**Development of a Non-Formal Education Program base on Problem-Based Learning and Self-Directed Learning to Develop Personal mastery Competency for Head Nurses**
1. Objective
2. Learning groups
3. Facilitators
4. Contents
5. Learning activities
6. Learning resources and learning material
7. Measurement and evaluation
8. Environment

**Relevance factors such as success, problem and obstacles in implementing the developed program.**
− Support factors
− Problem/obstacle factors
− Remedies

**Figure 1: Conceptual framework**
**(To Development of A Non-Formal Education Program Based on Problem-Based Learning and Self-Directed Learning to Develop Personal Mastery Competency for Head Nurses)**